PV Cooler, Water calculation

Latent heat of evaporation 0.7 kwh/litre

280 watt panel area 2m^2

Total daily heat energy 4 hours\*1kw/m^2 = 8kwh

Assume effective heat removal of 2kwh will require evaporating approximately 3 litres of water per panel per day.

Operation regime:

Spray 3 litres/day over a period of 5 hours. Spray 5 second intervals and pause for 2 minutes. Approximately 30 sprays per hour or 2.5 minutes per hour. Total 12.5 minutes of daily operation.

Nozzle Flow Rate = **0.24 liter/minute**

**Number of panels = 11 , total throughput 2.64 l/min**

**PQM 60 pump can provide 30 Meter head ad 15 l/min**

**For 36 panels (10 kw), 8.64 l/min requires**

**For 200 panels (50 kw) 48 l/min at 30m requires PQM 70 or PQM80**

**Water pressure** <http://irrigation.wsu.edu/Content/Calculators/Sprinkler/Nozzle-Requirements.php>

Required 0.24 liter/min at 40 meter head needs a 0.4mm nozzle.

Experiment:

Nozzle = 0.4mm diameter

Pressure 4 atm

750 cc in 7 minutes 15 seconds.

580 seconds to fill 1 litre.

1 litre in 9 minutes 40 seconds = 0.103 litre/min